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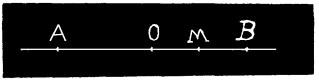
III. Solution by the PROPOSER.

The roots of $ax^2+2bx+c=0$ and $a'x^2+2b'x+c'=0$ will be harmonic if $ac'+a'c-2bb'=0$ (see Scott's Geometry, page 45).

Let $x^2=p^2$ give the points A and B. Let $x=OM=K<(OB=p)$ be midway between the other points, P and Q. The equation giving P and Q is

$$a'x^2+2b'x+c'=0, \text{ with the conditions } \frac{b'}{a}=-K, \text{ and } c'-p^2a'=0,$$

$$\text{or } x^2-2Kx+p^2=0.$$



But since $K<p$, $K^2-p^2<0$, the roots of this equation are imaginary, and since there are an indefinite number of values for $K<p$, there will be an indefinite number of pairs of imaginary points on the line harmonic with the given real pair. (Scott's Geometry, page 45.)

Solved in a similar manner by *G. B. M. ZERR.*

PROBLEMS.

63. Proposed by ALFRED HUME, C. E., D. Sc., Professor of Mathematics, University of Mississippi, P. O. University, Mississippi.

Prove, analytically :—A rectangular hyperbola cannot be cut from a right circular cone unless the angle at its vertex is greater than a right angle.

64. Proposed by WILLIAM E. HEAL, Member of the London Mathematical Society and Treasurer of Grant County, Marion, Indiana.

Let the bisectors of the angles A, B, C of a triangle meet the sides opposite A, B, C in A', B', C'. Let AA', BB', CC' meet the sides of the triangle $A'B'C'$ in A'', B'', C''. Let this process continue indefinitely. Express the sides and angles of the triangle $A^{(m)}B^{(m)}C^{(m)}$ in terms of the sides and angles of the original triangle ABC.